

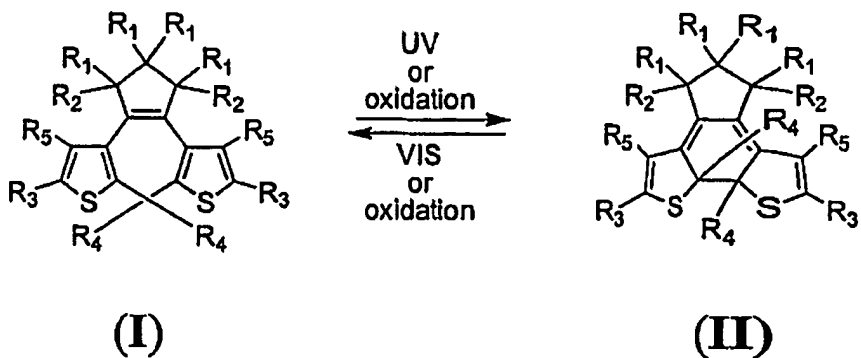
**This Listing Of Claims Will Replace All Prior Versions, And Listings, Of Claims In The**

**Application:**

**Listing of Claims:**

**WHAT IS CLAIMED IS:**

1. (Currently amended) A compound ~~selected from the group consisting of compounds~~ reversibly convertible ~~under photochromic and electrochromic conditions~~ between a ring-open isomer (I) and a ring-closed isomer (II):





wherein:

each R<sub>1</sub> is independently selected from the group consisting of H and a halogen;

each R<sub>2</sub> is ~~selected from the group consisting of~~ independently H, a halogen, or both R<sub>2</sub> when taken together form CH=CH, or R<sub>2</sub> is CH=CH and forms part of ~~and~~ a polymer backbone;


each R<sub>3</sub> is independently selected from the group consisting of H, a halogen, CO<sub>2</sub>Y (Y=H,

Na, alkyl, aryl),  and  (X=N,O,S);

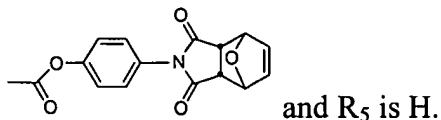
R<sub>4</sub> is ~~selected from the group consisting of~~ alkyl and aryl; and

each R<sub>5</sub> is independently selected from the group consisting of H, alkyl and aryl,

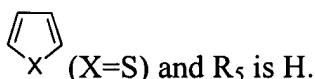
and wherein compound is convertible from said ring-open isomer (I) to said ring-closed isomer (II) under photochemical conditions and from said ring-closed isomer (II) to said ring-open isomer (I) under electrochemical conditions.

2. (Cancelled)
3. (Currently amended) The compound as defined in claim 1, wherein said compound is also convertible from said ring-closed isomer (II) to ring-open isomer (I) under ~~photochromic~~photochemical conditions and from said ring-open isomer (I) to said ring-closed isomer (II) under ~~electrochromic~~electrochemical conditions.
4. (Currently amended) The compound as defined in claim 21, wherein said compound is also convertible from said ring-closed isomer (II) to said ring-open isomer (I) under ~~photochromic~~photochemical conditions.
5. (Currently amended) The compound as defined in claim 41, wherein said compound is also convertible from said ring-open isomer (I) to said ring-closed isomer (II) under ~~photochromic~~electrochemical conditions.
6. (Currently amended) The compound as defined in claim 1, wherein the ~~electrochromic~~electrochemical conversion between said isomers (II) and (I) is catalytic.
7. (Original) The compound as defined in claim 1, wherein R<sub>1</sub> is F.
8. (Original) The compound as defined in claim 1, wherein R<sub>1</sub> and R<sub>2</sub> are F, R<sub>3</sub> and R<sub>4</sub> are  (X=S) and R<sub>5</sub> is H.

9. (Currently amended) The compound as defined in claim 1, wherein  $R_1$  and  $R_2$  are F, each  $R_3$  and  $R_4$  are is independently selected from the group consisting of aryl, and



10. (Original) The compound as defined in claim 1, wherein  $R_1$  and  $R_2$  are F,  $R_3$  is H,  $R_4$  is



11. (Original) The compound as defined in claim 1, wherein  $R_1$  and  $R_2$  are F,  $R_3$  and  $R_4$  are



12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Currently amended) The compound as defined in claim 1, wherein  $R_1$  is H,  $R_2$  is  $HC=CH$  and forms part of the ~~main chain of a polymer~~ backbone,  $R_3$  is Cl and  ~~$R_4$  and  $R_5$  are~~ is H.

18. (Currently amended) The compound as defined in claim 1, wherein  $R_1$  is H,  $R_2$  is  $HC=CH$  and forms part of the ~~main chain of a polymer~~ backbone,  $R_3$  is  $CO_2CH_3$  and  ~~$R_4$  and  $R_5$  are~~ is H.

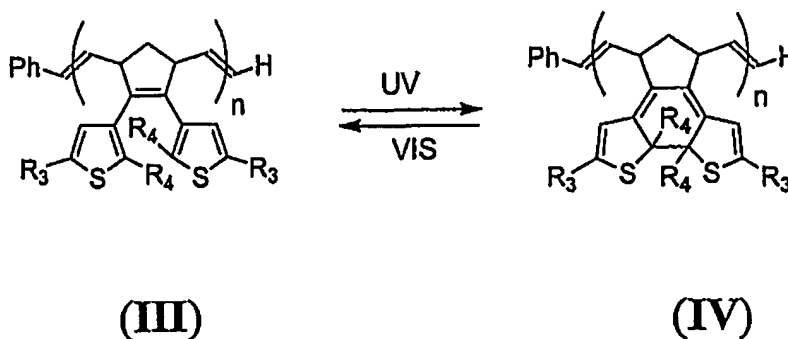
19. (Currently amended) The compound as defined in claim 1, wherein  $R_1$  is H,  $R_2$  is  $HC=CH$  and forms part of the ~~main chain of a polymer~~ backbone,  $R_3$  is  $CO_2H$  and  ~~$R_4$  and  $R_5$  are~~ is H.

20. (Currently amended) A polymer comprising the compound of claim 1, wherein  $R_2$  is  $CH=CH$  and forms part of the polymer backbone ~~main chain~~.



21. (Original) The polymer as defined in claim 20, wherein said polymer is a homopolymer.
22. (Original) The polymer as defined in claim 21, prepared by ring-opening metathesis polymerization.
23. (Currently amended) A method of preparing a compound according to claim 1, comprising carrying out the reaction steps set forth in any one of Schemes 2, ~~5~~, 6, 8, 10, or 12, 13, 14, 16 and 18.
24. (Currently amended) ~~The~~ A method of using use-of-a compound according to ~~any one of~~ claims 1 ~~to 19~~ in an electrochromic and/or photochromic device.
25. (Currently amended) The method use according to claim ~~23~~24, ~~which wherein said~~ electrochromic and/or photochromic device ~~is selected from the group consisting of:~~
- (1) ophthalmic lenses-eyeglasses that change color depending on the ambient light;
  - (2) actinometry an actinometric device; ~~and~~
  - (3) a molecular sensors;
  - ~~(3)(4) novelty items such as~~ photochromic inks;
  - (5) photochromic paints and;
  - (6) photochromic fibers;
  - ~~(4)(7) a variable transmission filterfilters—those that on command, regulate the amount and type of light that can be transmitted;~~
  - ~~(5)(8) a high-density optical information storage systemsystems (this invention is particularly well suited to this application as it provides more information storage sites per unit area);~~
  - ~~(6)(9) photo-regulated molecular switches that can be incorporated into molecular scale machinery;~~
  - ~~(7)(10) an optoelectronic systems;~~
  - ~~(8)(11) a reversible holographic systems; and, or~~

(9)(12) molecular switches in molecule-based wires and circuitry.

26. (Currently amended) A polymer comprising a compound interconvertible between a ring-open isomer (III) and a ring-closed isomer (IV):





wherein each  $R_3$  is independently selected from the group consisting of H, a halogen,  $\text{CO}_2\text{Y}$

( $\text{Y}=\text{H}$ , Na, alkyl, aryl),  and  ( $\text{X}=\text{N}, \text{O}, \text{S}$ ) and  $n$  is between 10 and 100.

27. (Currently amended) The polymer as defined in claim 26, wherein each  $R_3$  is independently selected from the group consisting of Cl,  $\text{CO}_2\text{CH}_3$  and  $\text{CO}_2\text{H}$ .



28. (New) The compound as defined in claim 1, wherein:

each  $R_2$  is independently H or a halogen, and

each  $R_3$  is independently selected from the group consisting of H, a halogen,  $\text{CO}_2\text{Y}$  ( $\text{Y}=\text{H}$ , Na, alkyl, aryl),  and  ( $\text{X}=\text{N}, \text{O}, \text{S}$ ).

29. (New) The compound as defined in claim 1, wherein:


each  $R_2$  is independently H or F;

each  $R_3$  is independently selected from the group consisting of H, a halogen  and  ( $\text{X}=\text{N}, \text{O}, \text{S}$ ), and

R<sub>5</sub> is H.

30. (New) The compound as defined in claim 1, wherein:



R<sub>1</sub> and R<sub>2</sub> are F;

each R<sub>3</sub> is independently selected from the group consisting of H and  (X=N,O,S), and R<sub>5</sub> is H.


31. (New) A method of preparing a polymer having electrochromic and photochromic properties, comprising utilizing a compound as defined in claim 1, wherein each R<sub>2</sub> is independently H or F, or both R<sub>2</sub> when taken together form CH=CH.

32. (New) The polymer as defined in claim 20, wherein:


R<sub>1</sub> is F;




each R<sub>3</sub> is independently selected from the group consisting of H, a halogen,  and  (X=N,O,S); and R<sub>5</sub> is H.

33. (New) The polymer as defined in claim 20, wherein R<sub>1</sub> is F.

34. (New) The polymer as defined in claim 20, wherein R<sub>1</sub> is F, R<sub>3</sub> and R<sub>4</sub> are  (X=S) and R<sub>5</sub> is H.

35. (New) The polymer as defined in claim 20, wherein R<sub>1</sub> is F, R<sub>3</sub> is aryl and R<sub>5</sub> is H.

36. (New) The polymer as defined in claim 20, wherein R<sub>1</sub> is F, R<sub>3</sub> is H, R<sub>4</sub> is  (X=S) and R<sub>5</sub> is H.

37. (New) The polymer as defined in claim 20, wherein  $R_1$  is F,  $R_3$  and  $R_4$  are  and  $R_5$  is H.
38. (New) A polymer comprising a main chain and the compound of claim 1, wherein each  $R_2$  is independently selected from the group consisting of H and F; and each  $R_3$  is independently selected from the group consisting of H, a halogen,  $\text{CO}_2\text{Y}$  ( $\text{Y}=\text{H}$ , Na, alkyl, aryl),  and  ( $\text{X}=\text{N}, \text{O}, \text{S}$ ), wherein at least one  $R_3$  is  $\text{CO}_2\text{Y}$  ( $\text{Y} = \text{aryl}$ ) and links the compound to the main chain of the polymer.
39. (New) A method of preparing a film, sheet, fiber or bead having electrochromic and photochromic properties, comprising utilizing a polymer as defined in claim 20.
40. (New) A method of preparing a film, sheet, fiber or bead having electrochromic and photochromic properties, comprising utilizing a polymer as defined in claim 38.
41. (New) A method of using a polymer according to claim 20 in an electrochromic and/or photochromic device.
42. (New) A method of using a polymer according to claim 38 in an electrochromic and/or photochromic device.